

METHODS OF SAMPLING AND TESTING
MT 110-04
METHOD OF TEST FOR
REINFORCED CONCRETE PIPE AND ASSOCIATED ITEMS
(Montana Test Method)

1 Scope:

- 1.1** The testing of concrete pipe and associated items will be done by the District laboratories where concrete plants are located. The Helena plant of the Elk River Company will be handled by the Materials Bureau. A jack, a wire gage, a supply of the necessary blank forms and a manual of instructions has been supplied to the District concerned.

2 Referenced Documents:

- 2.1** ***MT Manual:***
MT-108 Sampling and Certification of Portland Cement

3 Materials:

- 3.1** The materials covered by this procedure are those used in manufacturing reinforced concrete pipe, drop inlets, station markers, R/W monuments, guardrail posts and other pre-cast concrete items.
- 3.1.1** *Aggregates* - Samples of the aggregate used will be submitted to the Materials Bureau once a year, or whenever the source of supply changes. Acceptable reports showing NC laboratory numbers will be returned to the field for the District files and use on Form No. 19A.
- 3.1.2** *Cement* - Cement will be accepted by certificate in conformance with MT-108, Sampling and Certification of Portland Cement, except that the certificate which accompanies the shipment of cement shall be kept at the plant where the material is being fabricated. The certificate will be picked up by the District laboratory personnel who are charged with the responsibility for making the inspection of Reinforced Concrete Pipe and Associated Items and kept on file in the District laboratory.
- 3.1.3** *Reinforcing Steel and Wire Mesh* - It will be the responsibility of the pipe companies to notify the District laboratories when shipments of steel are received. Samples will then be sent to the Materials Bureau. Reports of acceptability will be returned to the District laboratory for their files and use on Form No. 19A.
- 3.1.4** *Concrete Cylinders* - Concrete cylinders, in sets of three, will be made periodically to represent the concrete placed in all concrete items. These cylinders need not be made for each project but a set should be made at such times as to fully represent the concrete being produced. These cylinders will be sent to the Materials Bureau showing the plant name and location as the project number. The cylinders will be assigned NC laboratory numbers in the Materials Bureau and when the cylinder reports are received back in the field, these NC numbers will be recorded on Form No. 19 to represent all concrete items not actually tested, and they shall be kept on file in the District laboratory.
- 3.1.5** *Pipe Strength Tests* - Actual strength tests will be made periodically in accordance with Montana Standard Specifications on concrete pipe within the range of the jack. These tests will be made whenever the need arises and they shall be reported on Laboratory Form No. 19. A copy of this report shall be sent to the Materials Bureau immediately for the assigning of NC Laboratory Numbers, after which it will be returned to the District laboratory for the District files. Laboratory Form No. 19 is self-explanatory as far as pipe entries are concerned. The column marked "absorption" may be ignored when conducting routine strength tests. Absorptions are run on sections of pipe representing a cross section of all of the concrete produced by the plant twice a year, usually in the spring and the fall.

3 Materials: (continued)

Sometime when routine pipe testing is being done, in the spring or again in the fall, the pipe being tested will be destroyed and absorption specimens obtained in accordance with Montana Standard Specifications. These absorption specimens will be sent to the Materials Bureau for testing and when the results are sent back to the District laboratory, they will be recorded on Form 19 covering the sections of pipe from which the samples were taken.

- 3.1.6** *Concrete items other than concrete pipe* - will also be entered on Form No. 19. These items, together with pipe too large to test, are represented by cylinder tests outlined above.

4 Procedure:

- 4.1** The procedure for listing concrete items used on the job and which require testing or certification is listed below.
- 4.1.1** Four copies are to be sent to the District where the project is located with one copy for the District Engineer, one copy for the Field Project Manager, one copy for the District Materials Supervisor and one copy to the Materials Bureau in Helena. One additional copy is to be sent to the Area Lab Supervisor if applicable. The District performing the inspection shall retain a copy for their records.
- 4.1.2** Lab. Form 19A - Concrete Items Certificate - When a significant portion of the concrete items have been tested and approved and are shipped to the project, this form shall be completed by the inspector and copies forwarded as follows:
- 4.1.1.1** Four copies are to be sent to the Supervisor, Division Construction Section, where the project is located with one copy to be marked for the attention of the Project Manager in charge of the project, one copy to the division office where the concrete items are being manufactured, and one copy to the Materials Bureau at Helena.
- 4.1.1.2** Three or more certificates may be required during the course of the project - one covering pipe items, another covering drop inlets, etc., and one covering station markers and guardrail posts.

5 Mark of Acceptance:

- 5.1** All concrete pipe must carry a mark of acceptance. The mark that has been adopted is a circle approximately 1 3/4 inches (44mm) in diameter with a black capital **M** in the center (see Fig. 1). This will be stamped on each length of pipe where it will be clearly visible. Absence of a Circle M Stamp will indicate a pipe is not complete, requires corrective work, or that the inspector was not present at the time the pipe was loaded on the truck for shipment.
- 5.1.1** This procedure does not make any change in our policy of accepting all pipe at the point of delivery. The circle **M** merely indicates the pipe was acceptable in the manufacturer's yard at the time it was inspected. Final acceptance must be made in the field and field personnel should be instructed to reject any concrete pipe which, in their opinion, is not acceptable after delivery to the job site.

6 Notification by Manufacturers:

- 6.1** The manufacturers of concrete pipe and other concrete items are hereby requested to notify the Highway Inspector before any shipments are made so that it is certain that all items to be shipped have been tested, inspected and properly marked. They are also warned that any shipments made without proper clearance and markings will be rejected in the field.



CIRCLE M STAMP

Fig. 1